

IN THE CLAIMS:

Claims 12 and 13 and 40 through 44 were previously cancelled. Claims 1, 7 through 11, 14, 20 through 24, 27, and 33 through 37 have been amended herein. All of the pending claims are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

1. (Currently amended) A semiconductor device assembly of a plurality of semiconductor device assemblies, comprising:
a semiconductor die having an active surface having a plurality of bond pads thereon and an opposing second surface;
at least one projection connected to at least one bond pad of the plurality of bond pads on the active surface of the semiconductor die for flip-chip bonding to a substrate, the at least one projection including one of at least one solder ball and at least one solder bump; and
a paddle frame of a plurality of paddle frames including a pair of side rails, a plurality of cross-members, and a plurality of generally centrally positioned paddles, the pair of side rails and the plurality of ~~cross-members~~ cross-members connected to a generally centrally positioned paddle of the paddle frame by a plurality of paddle support bars, the second surface of the semiconductor die being secured to the paddle, the paddle being attached to the side rail by at least two of the plurality of paddle support bars and being attached to the ~~cross-members~~ cross-members by at least two of the plurality of support bars.

2. (Previously presented) The semiconductor device assembly of claim 1, wherein the at least one projection includes a plurality of projections comprising a ball grid array (BGA) of solder balls.

3. (Previously presented) The semiconductor device assembly of claim 1, wherein the at least one projection comprises at least one ball deposited by a wire bonding machine.

4. (Previously presented) The semiconductor device assembly of claim 1, wherein the at least one projection comprises at least one stud bump deposited by a wire bonding machine.

5. (Previously presented) The semiconductor device assembly of claim 1, further comprising:
an electrically non-conductive adhesive layer securing the second surface to the generally centrally positioned paddle.

6. (Previously presented) The semiconductor device assembly of claim 5, wherein the adhesive layer comprises one of epoxy and polyimide.

7. (Currently amended) The semiconductor device assembly of claim 1, further comprising:
an electrically conductive adhesive layer securing ~~said~~ the second surface of ~~said~~ the semiconductor die to ~~said~~ the generally centrally positioned paddle.

8. (Currently amended) The semiconductor device assembly of claim 7, wherein ~~said~~ the electrically conductive adhesive layer comprises a eutectic material.

9. (Currently amended) The semiconductor device assembly of claim 7, wherein ~~said~~ the electrically conductive adhesive layer comprises a gold-silicon eutectic material.

10. (Currently amended) The semiconductor device assembly of claim 7, wherein ~~said~~ the electrically conductive adhesive layer comprises a metal-filled polymer, ~~said~~ the metal filling comprising a heat conductive material.

11. (Currently amended) The semiconductor device assembly of claim 7, wherein ~~said~~ the electrically conductive adhesive layer comprises conductive polyimide.

12. (Cancelled)

13. (Cancelled)

14. (Currently amended) A semiconductor device assembly of a plurality of semiconductor device assemblies, comprising:
a semiconductor die having an active surface having at least one bond pad thereon and an opposing second surface;
at least one projection secured to the at least one bond pad on the active surface of ~~said~~ the semiconductor die configured for flip-chip connection to a substrate, the at least one projection including one of at least one solder ball and at least one solder bump; and
a metal paddle from a paddle frame having no narrow common electrical leads for connection to the semiconductor die of a plurality of paddle frames connected by a pair of rails having a plurality of ~~cross-members~~ cross-members therebetween, ~~said~~ the second surface of the semiconductor die being attached to the paddle, the metal paddle attached to at least one side rail by at least a plurality of paddle support bars and being attached to a plurality of ~~cross-members~~ cross-members by the support bars, the paddle support bars not used for electrical leads for the semiconductor die.

15. (Previously presented) The semiconductor device assembly of claim 14, wherein the at least one projection comprises a ball grid array (BGA) of solder balls.

16. (Previously presented) The semiconductor device assembly of claim 14, wherein the at least one projection comprises at least one ball deposited by a wire bonding machine.

17. (Previously presented) The semiconductor device assembly of claim 14, wherein the at least one projection comprises at least one stud bump deposited by a wire bonding machine.

18. (Previously presented) The semiconductor device assembly of claim 14, further comprising:
an electrically non-conductive adhesive layer attaching the second surface to the paddle.

19. (Previously presented) The semiconductor device assembly of claim 18, wherein the adhesive layer comprises one of epoxy and polyimide.

20. (Currently amended) The semiconductor device assembly of claim 14, further comprising:
an electrically conductive adhesive layer attaching ~~said~~ the second surface to ~~said~~ the metal paddle.

21. (Currently amended) The semiconductor device assembly of claim 20, wherein ~~said~~ the electrically conductive adhesive layer comprises a eutectic material.

22. (Currently amended) The semiconductor device of claim 20, wherein ~~said~~ the electrically conductive adhesive layer comprises a gold-silicon eutectic material.

23. (Currently amended) The semiconductor device assembly of claim 21, wherein ~~said~~ the electrically conductive adhesive layer comprises a metal-filled polymer, ~~said~~ the metal filling comprising a heat conductor.

24. (Currently amended) The semiconductor device assembly of claim 21, wherein ~~said~~ the electrically conductive layer comprises conductive polyimide.

25. (Previously presented) The semiconductor device assembly of claim 14, further comprising:

a substrate having a plurality of circuit connections, the at least one bond pad connected to at least one circuit connection of the plurality of circuit connections.

26. (Previously presented) The semiconductor device assembly of claim 25, further comprising:

sealant packaging covering a portion of the semiconductor die and a portion of the substrate.

27. (Currently amended) A semiconductor device assembly of a plurality of semiconductor device assemblies, comprising:

a semiconductor die having an active surface having a plurality of bond pads thereon and an opposing second surface;

a plurality of projections connected to the plurality of bond pads for direct connection to a host circuit board, the plurality of projections including one of a plurality of solder balls and a plurality of solder bumps; and

a metallic paddle having no electrical leads for connection to a semiconductor die secured to the second surface of the semiconductor die, the metallic paddle being attached to at least one side rail by at least a plurality of paddle support bars that include one of being used as a lead and not being used as a lead and being attached to a plurality of ~~cross-members~~ cross-members by the support bars of a paddle frame.

28. (Previously presented) The semiconductor device assembly of claim 27, wherein the plurality of projections comprises a ball grid array (BGA) of solder balls.

29. (Previously presented) The semiconductor device assembly of claim 27, wherein the plurality of projections comprises balls deposited by a wire bonding machine.

30. (Previously presented) The semiconductor device assembly of claim 27, wherein the plurality of projections comprises a plurality of stud bumps deposited by a wire bonding machine.

31. (Previously presented) The semiconductor device assembly of claim 27, further comprising:
an electrically non-conductive adhesive layer connecting the second surface to the metallic paddle.

32. (Previously presented) The semiconductor device assembly of claim 31, wherein the adhesive layer comprises one of epoxy and polyimide.

33. (Currently amended) The semiconductor device assembly of claim 27, further comprising:
an electrically conductive adhesive layer connecting ~~said~~ the second surface to ~~said~~ the metallic paddle.

34. (Currently amended) The semiconductor device assembly of claim 33, wherein ~~said~~ the electrically conductive adhesive layer comprises a eutectic material.

35. (Currently amended) The semiconductor device assembly of claim 33, wherein ~~said~~ the electrically conductive adhesive layer comprises a gold-silicon eutectic material.

36. (Currently amended) The semiconductor device assembly of claim 33, wherein ~~said~~ the electrically conductive adhesive layer comprises a metal-filled polymer, ~~said~~ the metal filling comprising a heat conductive material.

37. (Currently amended) The semiconductor device assembly of claim 33, wherein ~~said~~ the electrically conductive adhesive layer comprises conductive polyimide.

38. (Previously presented) The semiconductor device of claim 27, further comprising:
a substrate having a plurality of circuit connections, the plurality of bond pads connected to the plurality of circuit connections.

39. (Previously presented) The semiconductor device assembly of claim 38, further comprising:
sealant packaging covering a portion of the semiconductor die and a portion of the substrate.

40.-44. (Cancelled)